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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/529,747 | 03/30/2005 | Eiichi Takahashi | 040894-7203 | 1586 |
| 9629 7590 01/31/2007 MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004 | | | EXAMINER STAFFORD, PATRICK | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2828 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 01/31/2007 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/529,747 | Applicant(s) TAKAHASHI ET AL. | |
| | Examiner Patrick Stafford | Art Unit 2828 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>3/30/2005</u> <u>11/07/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasyuk et al (Compression of light pulses by stimulated Raman scattering without a frequency shift" Sov. J. Quantum Electron., vol. 19, no. 8) in view of Takahashi et al (JP 2002-62553, hereafter '553).

Claims 1 and 4: Grasyuk teaches a method for generating an ultrashort pulse (paragraph 1), comprising the steps of:

converting a laser pulse once into a laser pulse having another wavelength and reconvert the laser pulse having another wavelength into a laser pulse having the initial wavelength (paragraph 4 and Fig. 1).

Grasyuk teaches the example of amplification in a pulse generating system (paragraph 12), however it does not explicitly teach it in conjunction with converting and reconvert the laser pulse. Takahashi '553 teaches saturation amplifying the pulse by a laser to generate an ultrashort pulse to improve the contrast at a front part of the pulse (paragraph 5). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use saturation amplification in conjunction with

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converting and reconvert the laser in order to improve the contrast at a front part of the pulse.

Claim 2: Grasyuk teaches the method of claim 1, as discussed above, wherein the laser is an excimer laser (paragraph 1).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grasyuk in view of Takahashi '553, as applied to claim 2 above, and further in view of Holmes (U.S. Patent 4,812,682, hereafter '682).

Grasyuk and Takahashi '553 teach the method of claim 2, as discussed above, wherein the laser pulse is converted into a pulse having another wavelength by performing stimulated Raman scattering (Grasyuk, paragraph 2). They do not explicitly teach the reversion of the pulse to a pulse having the initial wavelength being performed by four-wave mixing. Holmes '682 teaches it is suitable to use four-wave mixing to reconvert the pulse to a pulse having the initial wavelength (col. 4, lines 17-25 and col. 4, lines 29-31). The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use four-wave mixing to reconvert the pulse to a pulse having the initial wavelength.

Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasyuk in view of Takahashi '553 and further in view of Holmes (U.S. Patent 4,812,682, hereafter '682).

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Claims 5-6 and 8: Grasyuk teaches an ultrashort pulse generating apparatus, comprising:

an excimer laser (paragraph 1);

a laser pulse is once converted into a laser pulse having another wavelength

(paragraph 4 and Fig. 1);

the laser pulse having another wavelength is reconverted into a laser pulse having an initial wavelength (paragraph 4 and Fig. 1).

Grasyuk teaches the example of amplification in a pulse generating apparatus (paragraph 12), however it does not explicitly teach it in conjunction with converting and reconvert the laser pulse. Takahashi '553 teaches saturation amplifying the pulse by a laser to generate an ultrashort pulse to improve the contrast at a front part of the pulse (paragraph 5). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use saturation amplification in conjunction with converting and reconvert the laser in order to improve the contrast at a front part of the pulse.

Grasyuk and Takahashi '553 do not explicitly teach the use of a ($\lambda/4$)-wavelength plate and a polarizer. However, Holmes '682 teaches the use of a polarizer and ($\lambda/4$)-wavelength plate in an ultrashort pulse generating apparatus would be suitable (col. 4, lines 16-31). The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polarizer and ($\lambda/4$)-wavelength plate in an ultrashort pulse generating apparatus.

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Claim 7: Grasyuk, Takahashi '553 and Holmes '682 teach the apparatus of claim 5, as discussed above. Grasyuk teaches the laser pulse being converted into a pulse having another wavelength by performing stimulated Raman scattering (Grasyuk, paragraph 2). Holmes '682 teaches the reconversion of the pulse to a pulse having the initial wavelength by four wave mixing (col. 4, lines 17-31).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Stafford whose telephone number is (571) 270-1275. The examiner can normally be reached on M-Th 7:30-5 EST.

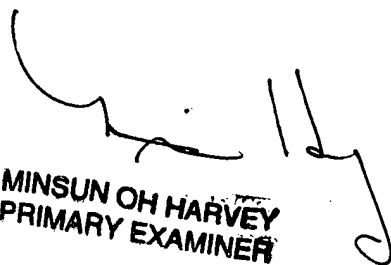
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PRIMARY EXAMINER